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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,808	06/20/2003	Curtiss Renn	NPW 347	9258

23581 7590 09/23/2005  
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EXAMINER

PATEL, VINIT H

ART UNIT PAPER NUMBER

1764

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/600,808	Applicant(s) RENN, CURTISS	
	Examiner Vinit H. Patel	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 17, 25-29 and 36-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-16, 18-25, 30-35, 40 and 41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>13Jul05; 20Jun03</u> . | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Election/Restrictions***

Claims 1-41 are pending. Applicant's election without traverse of species a-1, b-2 and c-1 in the reply filed on August 12, 2005 is acknowledged.

Claim 17 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim.

Claims 5-7, 25-29 and 36-39 which read on non-elected species a-2, a-3 and a-4, or b-1, b-3 and b4, or c-2 and c-3, which are different embodiments of the invention, and are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim.

Therefore claims 1-4, 9-16, 18-25, 30-35 and 40-41 are examined on the merits.

### ***Claim Analysis***

In claim 1, Examiner has interpreted the term "less than approximately 5% copper oxide" (L10) to mean the catalyst can contain no copper oxide.

In claim 4, Examiner has interpreted, in light of applicant's specification, the term "majority" to mean at least 20% or greater wt. of zinc oxide.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 9-16, 18-25, 30-35 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edlund et al., US Patent No. 6,319,306, in view of Wieland et al., US Patent No. 6,413,449.

Regarding claims 1-4, 19, 24, 25, 32, 34 and 35, Edlund teaches a reforming region 32 including a steam reforming catalyst 34 (C4/L15-25); a suitable heating mechanism to heat the reforming region to a temperature between 200-700 C (C5/L14-25); a separation region 38 wherein the hydrogen containing stream is separated into one or more byproduct streams 40 and a hydrogen rich stream 42 (C4/L25-36; Figs. 1-3). However Edlund does not explicitly teach the reforming catalyst is non-pyrophoric and contains less than 5% or 3% or 0% wt. copper oxide.

Wieland teaches a catalyst for steam reforming comprising zinc oxide and no copper oxide wherein a majority component is zinc oxide and the catalyst is utilized at temperatures between 200-400 C (C9/L44 – C10/L48), further teaches catalytic means that does not produce methane (C1/L4-30), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Edlund to utilize the catalyst disclosed in Wieland for the purpose to provide a reforming catalyst having high selectivity and specific hydrogen productivity (Wieland, C4/L46-56).

Furthermore, the claimed catalyst and prior art are substantially identical and therefore it is presumed that the properties of the claimed catalyst being non-pyrophoric and having an initial activity and a second activity after at least 1000 hours of use that is 75% of the initial activity are inherent in the prior art catalyst. See In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977) & MPEP 2112.

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Regarding claims 9 and 20, Wieland teaches the catalyst is not adapted to produce methane, but is adapted to produce hydrogen rich gas by reforming methanol (C1/L4-10).

Regarding claims 10-12, 21, 22, 23 and 33 Wieland teaches the claimed catalyst and prior art are substantially identical (contains less than 5% or 3% or 0% wt. copper oxide) (C9/L44 – C10/L48) and therefore it is presumed that the properties of the claimed catalyst being non-pyrophoric, not sintered during production of mixed gas stream, and having a initial activity and a second activity after at least 1000 or 2000 or 5000 hours of use that is 75% of the initial activity are inherent in the prior art catalyst. See In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977) & MPEP 2112.

Regarding claim 13, Edlund teaches the reforming catalyst bed is air permeable that does not require housing or shielding (C5/L27-45; Figs. 3 & 4).

Regarding claim 14, Edlund teaches a separation region wherein at least one hydrogen selective membrane having a surface that is exposed to the mixed gas stream, wherein the product hydrogen is formed from at least a portion of the mixed gas stream that permeates through the at least one hydrogen selective membrane, further wherein the by-product stream is formed from at least a portion of the mixed gas stream that does not pass through the at least one hydrogen selective membrane (C6/L21-C7/L22). Furthermore, expressions relating the apparatus to the product and by-product gas streams an intended operation are of no significance in determining patentability of the apparatus claim. See Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

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Regarding claim 15, Edlund teaches the hydrogen selective membrane is formed from an alloy comprising palladium and copper (C7/L1-22).

Regarding claim 16, Edlund teaches the separation region includes a pressure driven separation process 42 (pressure swing adsorption system) (C4/L26-35).

Regarding claims 18, 31 and 41, Edlund teaches a fuel cell stack (PEM, which utilizes oxidant and hydrogen to produce electric current) adapted to receive an oxidant stream and a portion of the product hydrogen to produce electric current (C3/L42-64).

Regarding claims 30 and 40, Edlund teaches the separation region 48 adapted to receive the mixed gas stream and separate the mixed gas stream into a product hydrogen stream and a by-product stream, wherein the hydrogen stream has a greater concentration of hydrogen gas and reduced concentration of other gases in the mixed stream and wherein the region includes any suitable structure for reducing the concentration of the selected compositions in stream 42 (C4/L26-C5/L26). Furthermore, expressions relating the apparatus to the product and by-product gas streams an intended operation are of no significance in determining patentability of the apparatus claim. See Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinit H. Patel whose telephone number is (571) 272-0856. The examiner can normally be reached on 9:00 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



VHP



Glenn Caldarola  
Supervisory Patent Examiner  
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